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Dear Radical Owner

Many thanks for purchasing a **Radical** sports racing car.

If prepared and maintained properly this car will give you more enjoyment than almost any other activity I can think of.

Depending upon the part of the world you live in and the championships you race in, the Radical is available with a wide range of engines, suspension set-ups, aerodynamic packages and tyre configurations. One thing remains constant however, a well prepared and maintained car will ensure that you get the maximum performance and reliability the Radical is renowned for the world over.

Radicals have covered hundreds of thousands of racing miles, from short sprints to endurance races. This manual highlights many of the lessons we have learned.

Happy racing.

Mick Hyde

Mick Hyde.

For Radical Motorsport Ltd

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Preparation for Shake-Down

Before taking to the track, it is important that you carry out a thorough spanner check, paying particular attention to all hoses, connections and suspension fixings, brake bias etc..

Check all fluid levels

The oil level should be ***no lower*** than three quarters up the sight-glass, with the ***motor warm and running***. The sump is baffled and the oil takes some time to settle. Only use Radical recommended oil, i.e. Silkolene Pro 4 synthetic based racing oil which is formulated to run in the integral gearbox and clutch as well as the engine (see running in). Use only high temperature racing brake fluid.

Starting The Engine

Motors with CV carbs - slide choke mechanism full on, start the engine and allow to warm before depressing throttle.

Motors with flat-slide carbs - depress the throttle fully 2-3 times, then depress it a small amount and start the engine. Allow the engine to warm before depressing throttle further

Power Seating

After the motor has been brought to working temperature, it should be driven off, short shifting through the gearbox until you are in top gear. Drop the speed down to the lowest it will reasonably pull away in top gear. Then accelerate hard for a few seconds and then snap shut the throttle and coast for a few seconds. Do this fifteen times as a minimum. Accelerating hard, but only using low revs, pushes the rings hard onto the bores. By then snapping shut the throttle, oil is then dragged up to wash the bores clean. Keeping the revs low will eliminate the chance of glazing the bores.

Running-In

Now the motor needs to be run in for at least two hours. You must not use more than 80% of the engine revs. Vary the speed, short shift, and do not hold it at constant revs. The engine is supplied from the factory with mineral oil for running-in purposes.

Change to Radical-recommended synthetic based racing oil when running-in is complete.

Watch the temperature and pressure gauges, return to the pits regularly, and thoroughly check all hose fittings for leaks.

Bedding-In Brakes

The car comes fitted with carbon metallic brake pads. To bed in the brakes and achieve maximum stopping power, a film of carbon must be transferred to the discs

Gently apply brakes 6 to 8 times at medium speed. Increase speed to simulate race conditions, and apply brakes hard a further 6 to 8 times.

Allow brakes to cool for 15 minutes. Do not apply brakes whilst stationary during cooling down period. The car is now ready to race.

Use only Radical recommended brake pads ie Blue 9012 or MT 4 HT8 Gold.

Bedding-In CV Joint

The CV joints require a minimum of 2 hours of bedding-in before extended running periods are undertaken. Restrict runs to no more than 15 minutes to allow heat build-up to dissipate from the joints. Failure to bed in CV joints will cause overheating which will result initially in the protective boot being blown off, and eventually failure of the joint. Always re-pack the CV joint with high temperature graphite grease.

Chain

Lubricate chain lightly before every run. i.e. every half an hour. Use a Radical-approved, synthetic chain spray lubricant.

Chain tension should be set at $\frac{1}{2}$ "- $\frac{3}{4}$ " of play at extremes of movement. Tension should be measured at three points around the sprocket circumference to check for tight spots.

Chain alignment should be checked using a straight edge placed on the face of the rear sprocket, and lined-up with the front sprocket.

If the chain is lubricated, tensioned and aligned correctly, it will give many trouble-free racing miles.

Note: As a precaution, it is recommended that the chain be replaced after twelve hours of racing miles. Only replace with a high-strength Radical chain.

Oil Level

Oil level should be no lower than three-quarters of the way up the sight-glass with motor warm and running.

**The Chassis must be level (checked with a spirit level)
when the oil is checked.**

Important note.

Due to the nature of the baffling in the sump, the oil level takes a long time to stabilise. The level **MUST** be checked continually over 1-2 minutes

We recommend SILKOLENE PRO-4 Synthetic-based race-formulated oil which incorporates anti-foaming agents, and is formulated to run in the integral gearbox and clutch as well as the engine.

Oil should be changed after a minimum of six (6) hours of circuit use.

Fuel

Kawasaki 1000 & Powertec 1500 - use Super Unleaded (98 octane minimum)

Yamaha 1000, Kawasaki 1100 & Suzuki 1300 - use Regular Unleaded (95 octane minimum)

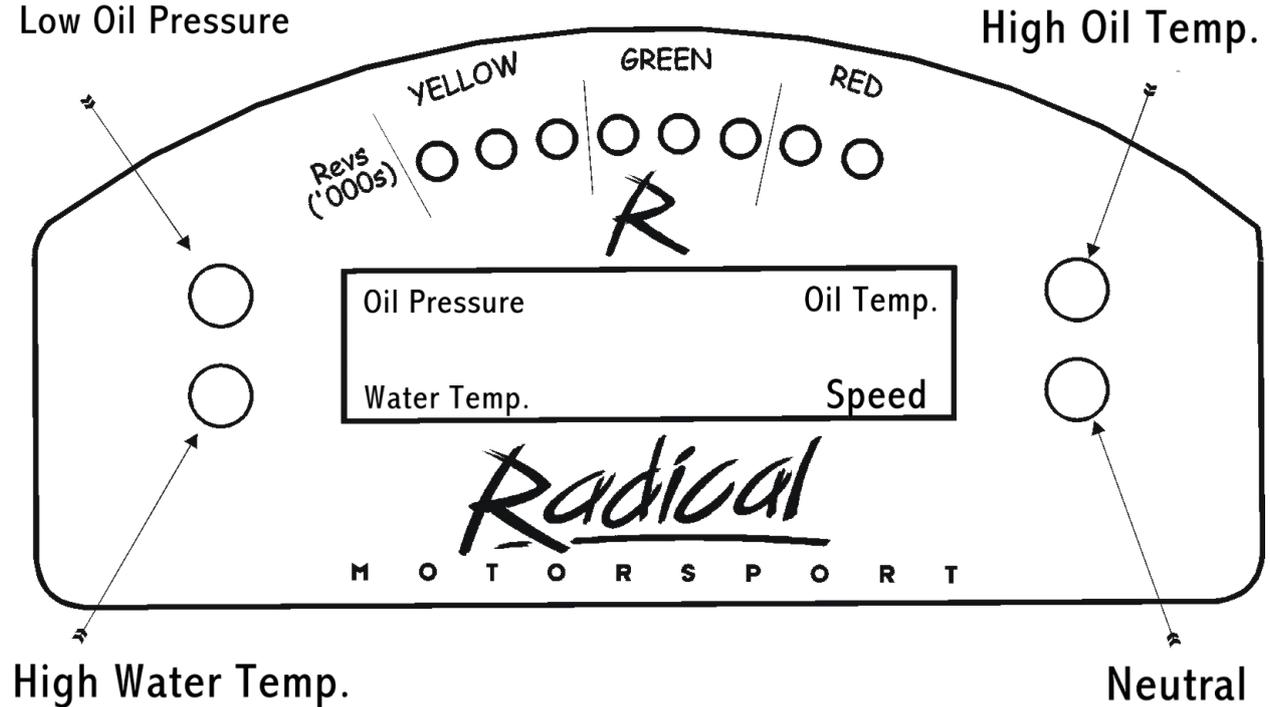
Higher compression ratio engines (in the USA) should only be run on racing fuel such as cam2, or a minimum of 108 octane. We do **NOT** recommend mixing octane boosters in pump fuel.

Valve Clearances

Check valve clearances after 2 meetings, then a further twice during the season.

<u>Kawasaki Engines</u>	<u>Suzuki & Yamaha Engines</u>
Inlet valves should be set at 5-7 thou (0.005"-0.007").	Inlet valves should be set at 4-8 thou (0.004"-0.008").
Exhaust valves at 7-9 thou. (0.007"-0.009"-set cold).	Exhaust valves at 8-12 thou. (0.008"-0.012"-set cold).

Dashboard



Rev Indicator

Kawasaki 1000 & 1100 & Yamaha 1000 revs ('000s)
Yellow 5 - 6 - 7, Green 8 - 9 - 10, Red 11 - 11½

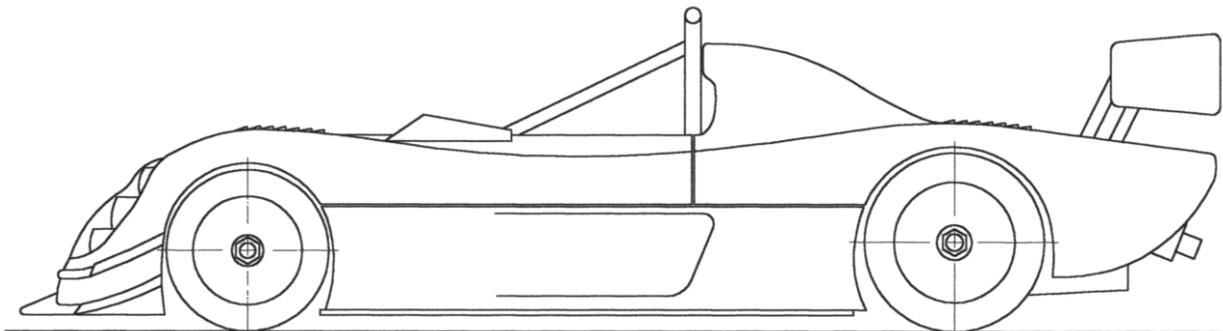
Suzuki 1300 revs ('000s)

Yellow 4 - 5 - 6, Green 7 - 8 - 9, Red 10 - 10½

High temperatures, or low pressures will trigger a large warning light adjacent to the gauge it is indicating. If the figure shown immediately goes from normal to 157°C, this usually means that the wire has become disconnected from the sender unit, or the sender has failed.

Suspension

The car is set up at the factory but, the final settings should be arrived at by testing for the particular driver's preference and the particular circuit. Try to check the tyre temperatures for balance across the contact patch within one minute of a fast lap. The inside edge can be 10°-15° higher than the outer edge on Radial tyres, and slightly less on cross-plys. A good starting point is the following:-



Factory Recommended Settings

Cross Ply Tyres

Front

Camber
Toe In
Tyre Press. (Cold)
Tyre Press. (Hot)
Ride Height
Anti-Roll Bar

1° - 1½° negative
0-1/32" in (per wheel) 0-1/16" in (overall)
14-16psi
19-22psi
65mm
Medium

1° - 1½° negative
0-1/32" in (per wheel) 0-1/16" in (overall)
14-16psi
19-22psi
65mm
Medium

Front

Camber
Toe In
Tyre Press. (Cold)
Tyre Press. (Hot)
Ride Height
Anti-Roll Bar

Rear

Camber
Toe In
Tyre Press. (Cold)
Tyre Press. (Hot)
Ride Height
Anti-Roll Bar

0° - 1° negative
1/32"-1/16" in (per wheel) 1/16"- 1/8" in (overall)
14-16psi
19-22psi
70mm
Centre Hole

0° - 1° negative
1/32"-1/16" in (per wheel) 1/16"-1/8" in (overall)
14-16psi
19-22psi
70mm
Centre Hole

Rear

Camber
Toe In
Tyre Press. (Cold)
Tyre Press. (Hot)
Ride Height
Anti-Roll Bar

Radial Tyres

Front

Camber
Toe In
Tyre Press. (Cold)
Tyre Press. (Hot)
Ride Height
Anti-Roll Bar

3° - 4° negative
0-1/32" in (per wheel) 0-1/16" in (overall)
14-16psi
19-22psi
65mm
Medium

3° - 4° negative
0-1/32" in (per wheel) 0-1/16" in (overall)
14-16psi
19-22psi
65mm
Medium

Front

Camber
Toe In
Tyre Press. (Cold)
Tyre Press. (Hot)
Ride Height
Anti-Roll Bar

Rear

Camber
Toe In
Tyre Press. (Cold)
Tyre Press. (Hot)
Ride Height
Anti-Roll Bar

2° - 3° negative
0-1/32" in (per wheel) 0-1/16" in (overall)
14-16psi
19-22psi
70mm
Centre Hole

2° - 3° negative
0-1/32" in (per wheel) 0-1/16" in (overall)
14-16psi
19-22psi
70mm
Centre Hole

Rear

Camber
Toe In
Tyre Press. (Cold)
Tyre Press. (Hot)
Ride Height
Anti-Roll Bar

Note: Measure the ride height at front of chassis and the rear, at the rear seat back bulkhead, (below rollover bar) with the driver seated and three gallons of fuel in the tank.

Also Note: Radial tyres will need large amounts of negative camber to achieve optimum temperature spread, and ultimate grip.

Brake Bias Settings

Set central to two turns towards front (clockwise on the dash adjuster). Further adjustment can be made to suit individual circuits and tyre configurations. Adjust bias to the rear in wet conditions

Gearing

1000cc & 1100cc cars are fitted with a 15 tooth front sprocket, and a 48 tooth rear sprocket. 1300cc cars are fitted with a 16 tooth front sprocket, and a 48 tooth rear sprocket. Additional 46, 47, 49 & 50 tooth sprockets are available for the rear, and 16 & 17 tooth sprocket for the front.

Note: 1 tooth on the front is equivalent to approx. 3 teeth on the rear.

When changing the rear split sprocket, ensure that the chamfered edge locates on the differential, and that the number of teeth stamped on the two halves are both on the same side.

The gearing should be set so that the car is pulling strongly in top at the end of the fastest section of the circuit.

Damper Settings

Avo

Front	3 clicks clockwise
Rear	6 clicks clockwise

Koni

Front	Bump	+1
	Rebound	+1

Rear	Bump	+2
	Rebound	+3

Further adjustments should be made to suit individual circuits and driver performance.

Centre-Lock Hub Nuts

Anodised RED for left-hand side,
Anodised BLUE for right-hand side.

Torque Settings

Front wheel bearing	180-200 ft lbs.
Rear Hub Nut	180-200 ft lbs.
Wheel nut - (4 stud fixing) (centre lock)	55-65 ft lbs. 200 ft lbs
Gearbox output sprocket nut	90 ft lbs

Corner weights

For maximum performance, the Radical should have the corner weights accurately set with the driver in situ. The procedure is as follows:-

1. Position the car on a flat, horizontal surface.
2. Equalise all tyre pressures to hot setting, say 20 psi.
3. Take all readings with driver in car, or equivalent weight in the seat.
4. Remove bolt from one end of Nik-Link, disconnect rear anti-roll bar and adjust shocks to full soft.
5. Set ride height front & rear, then camber front & rear and finally toe-in front & rear.
6. Put car on weight scales, and set corner weights by adjusting spring platforms. A typical reading with a 180-200lb driver will be:-

Front 220 lbs 230 lbs

Rear 330 lbs 340 lbs

It is usually difficult to achieve identical settings on each corner to within 10%. Ensure that the sum of the diagonal weights are as near as possible.

7. Re-check ride height and splitter height with the body on.
8. Lock spring platforms.
9. Refit Nik-Link, rear anti-roll bar, reset shocks, and reduce tyre pressures.

Note: if the bolt does not slip-in, to the Nik-Link remove the bar and tweak it until the bolt slips in easily.

10. You are now ready to “rock & roll”.

Air Jacks

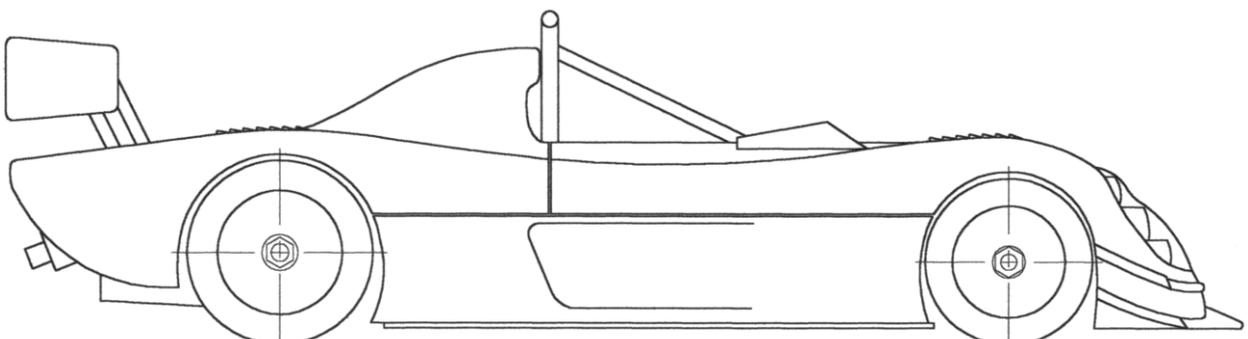
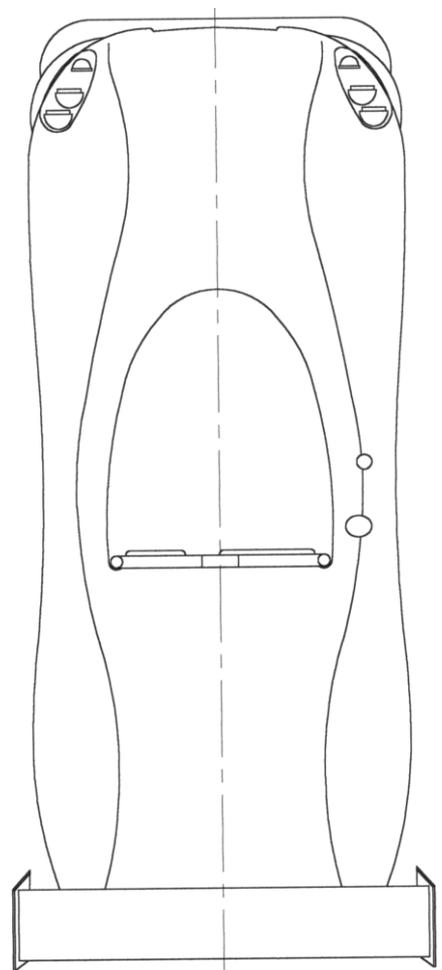
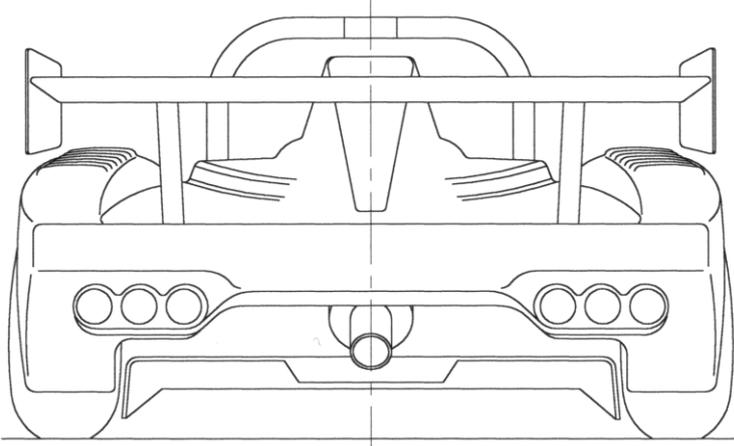
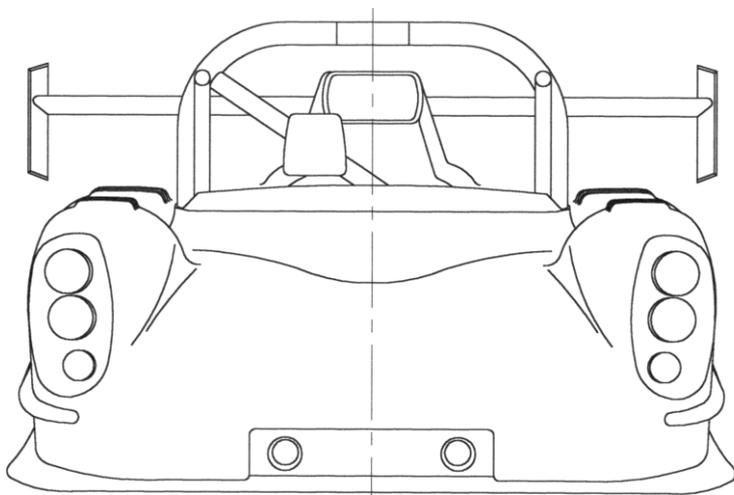
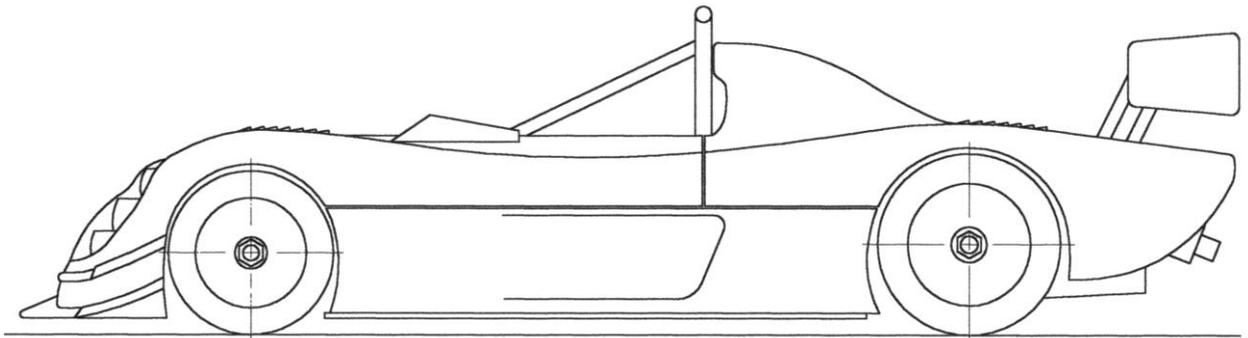
Cars fitted with air jacks are supplied with an air lance which is inserted into a valve at the rear of the car. The lance requires connection to a bottled air supply, and the pressure should be regulated to 250-300lb

General Car Preparation

To keep you Radical looking at its best the fibreglass and carbon fibre items can be quickly and effectively cleaned with furniture polish, while all chassis, suspension and panel parts can be kept looking new by wiping them down with a cloth sprayed with WD40.

To reduce the ingress of water into the cockpit a number of small holes situated around the footwell should be sealed with black silicon. A splash-proof cover is available to go over the top of the footwell.

Decal Design Sheet



Contacts



Workshop	}	01733 331818	Phil Abbott
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Production & Spares		01733 331717	Paul Gandy
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